All dull colours, such as browns, olives, plums, &c., mean that vibrations of every wave-length in the white sunlight are absorbed almost entirely, a very small proportion being reflected. A deep red colour means that there is a less proportion of the longest waves absorbed; a deep violet, that there is a less proportion of the shortest waves absorbed; and a full green, that the absorption is less in the intermediate wave-lengths. These are the primary hues; but in objects which reflect the brilliant secondary hues—scarlets, yellows, blues, and pinks—the chief absorption is confined to a small area in the spectrum, a large proportion of the light being reflected.

There are, then, three distinct stages of coloration, viz. (1) that in which all wave-lengths are absorbed; (2) that in which absorption ceases in respect to about one-third of the spectrum; (3) that in which absorption ceases in respect to about two-thirds of the spectrum.

These three stages are progressive, and in the direction of progress from chaos to unity; from a condition of the protoplasm in which molecular elements of very diverse vibrating capacity are mixed up together, to a condition in which the capacities of these elements have become greatly simplified.

When we speak of an organism arriving at maturity, we imply that it began its career in a state of immaturity, and that it gradually progresses to the condition of maturity. In what that condition consists, or what fundamental changes have taken place, it may not be easy to say; but it is surely true, as a rule, that organisms in an early and immature state are comparatively dull in colour, and do not put on their brightest hues until the period of maturity, indicating that one of the characteristics of maturity is the simplification of the vibrating capacity of the molecules. If this be really a law of Nature, it is a far-reaching one, and will account for much. F. T. MOTT.

Leicester.

On the Soaring of Birds.

I HAVE thought that this habit can be explained as follows; at least as regards rooks, which I have often noticed soaring in flocks, especially in the spring, and I think usually in warm cloudy weather.

An upward convection current of warm air is established over some area. The birds stretch out their wings, and if the upward velocity of the current should happen to be just equal to the velocity with which a bird with outstretched wings would sink through still air (the "terminal velocity"), the bird would be supported; but if it were somewhat greater, the bird would be raised upwards. In that case he inclines his wings so that the resolved part of the pressure on the under side of the wings carries him forward at a uniform level. But this movement, being rectilinear, would take him outside the warm column which he is enjoying. A centripetal force is therefore needed to maintain the circular movement, and this is obtained by tipping the wings, so that the wing which points outwards is raised, and that which points inwards towards the warm column is depressed, as noticed by your correspondent. If the upward velocity of the current is not sufficient to support the bird, an occasional flap with both wings, and the subsequent sinking, supplies the deficiency of upward pressure.

O. FISHER.

IN your issue of August 21 (p. 397) Mr. Magnus Blix gives a very ingenious explanation of the soaring of birds. It appears, however, to me that this explanation rests upon a false basis.

In his illustration, Mr. Blix supposes a bird to be moving in a direction, relative to the wind, at right angles to that of the wind, its absolute velocity, therefore, being greater than that of the wind. He then supposes the bird, by movement of wing-plane, to change its direction to one opposite to that of the wind, and assumes that its absolute velocity, in the new direction, will be equal to the absolute velocity in the old.

Now it is probably true that a bird can change its direction without sensible loss of *velocity relative to the air*, but any velocity it may have, in virtue of the motion of the air, must remain as a component of the new velocity in the same direction as before, however the bird may change the direction of its wing-plane.

Now the supposed bird, in changing its direction at c, would still have the component of velocity due to the wind acting in direction ef as before. Its velocity relative to the wind, therefore, from c to d would be the original velocity at a (diminished in its passage from a to c); its absolute velocity the difference of the two velocities.

If this objection hold good, Mr. Blix's theory seems to be no longer an explanation. C. O. BARTRUM.

19 Well Walk, Hampstead, August 26.

Occurrence of a Crocodile on Cocos Islands.

DURING a recent visit to Cocos Islands Mr. Ross showed me the skull of a crocodile of small size which had appeared about a year previously on the islands. It was first seen by a native Cocosian, who reported that he had seen something between a lizard and a log of wood in the sea. It then reappeared upon another island and destroyed a number of ducks, and was eventually shot by Mr. Ross. The distance from Java, the nearest land, is fully 700 miles. It is remarkable that this animal should have swum so far, and managed eventually to strike this small patch of land in the middle of the ocean. I do not know another record of a big reptile travelling so far. Mr. Ross tells me that bamboo-rafts sometimes drift to Cocos, and perhaps it managed to help itself along on one of these.

The whole seas here, but especially the Straits of Sunda and Malacca Straits, are full of drift-fruits, seeds, sticks, stems of Nipa and Pandanus; and between the Straits of Sunda and Cocos, large patches of pumice rolled lumps and dust can be seen, the relics of the destruction of Krakatão.

H. N. RIDLEY.

Botanic Gardens, Singapore, August 6.

Helix nemoralis and hortensis.

I SHOULD be very pleased if some of the various conchological readers of NATURE would kindly furnish me with their records of these two shells. The questions I specially want to ask concerning them are as follows:—What varieties (with band-formulæ) have they found? What number of each variety and band-variation have they taken? What is the environmental condition of the localities where they have found them, as regards plant-life and geological formation? And, in addition, I want the records (and this is a special point) from separate and distinct hedges or banks.

J. W. WILLIAMS.

57 Corinne Road, Tufnell Park, N.

Mr. Williams's "British Fossils."

IN my review of Mr. Williams's "British Fossils," published in NATURE of August 28 (p. 412), I notice a slip on my part in regard to eclogite. I should have said that whereas this rock is stated to consist of red garnets and hornblende, it is usually described as being composed of red garnets and one of the pyroxenes, such as omphacite or smaragdite, or both.

Since writing the review I have come to the conclusion that the twice repeated term "dermoid types" is intended for "demoid types"; a term used in the second edition of Phillips's "Manual of Geology." THE REVIEWER.

August 29.

A Remarkable Rainbow.

I HAVE just seen a very remarkable rainbow. It was plus 60° in height, and thin. The sunset was lurid, with a mock sun to the south of the real one. D. MACGILLIVRAY.

Oxford, August 25.

NOTES.

ON Sunday, August 17, M. Janssen ascended to the Grands Mulets, and next day he reached a hut called the Cabane des Bosses, which an Alpinist, M. Vallot, of Paris, has erected at a point about 400 metres below the summit of Mont Blanc. According to the Paris correspondent of the *Times*, the second day's journey was made in a sledge, drawn and pushed by twenty-two guides. Tuesday, Wednesday, and Thursday M. Janssen spent in a part of the hut which M. Vallot has fitted up as a scientific laboratory. On Friday, as the weather was very clear, M. Janssen had his sledge dragged up to the summit of the mountain to complete his observations. At the ridge of the

Bosses, which is almost vertical, and bordered on both sides by beds of snow ready to fall in avalanches at the slightest motion, the guides begged him to leave the sledge. He did so, but after taking five or six steps he fell exhausted on the snow and had to return to the sledge. He went back to the Grands Mulets the same day, and on the following Sunday he reached the Hôtel de Mont Blanc, and rejoined Mme. and Mdlle. Janssen, who had watched all his movements through a telescope. The results obtained by M. Janssen on this occasion confirm those to which he was led by his previous observations at the Grands Mulets.

THE medical profession loses much by the death of Dr. James Matthews Duncan, F.R.S. He died of heart disease at Baden-Baden, on Monday, September 1. He was born at Aberdeen in 1826.

WE regret to have to record the death of Prof. Carnelly. He died suddenly on August 27, at the age of 38. He had held the chair of chemistry at Firth College, and at the Dundee University College; and two years ago he was appointed Professor of Chemistry at Aberdeen.

ANOTHER death which we are sorry to have to record is that of Miss North, who died on Saturday, August 30, at her residence, Mount House, Alderley, Wotton-under-Edge, Gloucestershire, after a prolonged illness.

ORAZIO SILVESTRI, the distinguished chemist and vulcanologist, died at Catania on August 17. He was fifty-five years of age. In 1863 he was appointed to the professorship of chemistry at the University of Catania, whence he was transferred, in 1874, to a corresponding chair at the University of Turin. Afterwards he returned to Catania, where he became professor of mineralogy, geology, and vulcanology. Prof. Silvestri was an enthusiatic student of Mount Etna, and carried on many important investigations during the eruptions of 1865, 1869, 1879, 1883, and 1886. Through his efforts an astronomical and meteorological observatory has been constructed on Etna at a height of 3000 metres.

THE British Pharmaceutical Association held its twenty-seventh annual meeting in Leeds on Tuesday and Wednesday. The chair was occupied by Mr. Charles Umney. The attendance was unusually numerous.

THE Sanitary Institute had a most successful Congress at Brighton last week. Among the presidential addresses was one on "Geology in its relation to hygiene, as illustrated by the geology of Sussex," by Mr. W. Topley, F.R.S., President of the Section for Chemistry, Meteorology, and Geology. The discussions at the various meetings did much to foster the interest of the public in the laws of public health; and we should have been glad to devote more attention to the proceedings but for the pressure on our space due to the meeting of the British Association.

THIS week the International Congress of Agriculture and Forestry is holding a series of meetings at Vienna. There are delegates from Great Britain and many other countries. The proceedings began on Monday evening with a reception given by the organizing committee. On Tuesday the opening address was delivered by Count Christian Kinsky, President of the Diet of Lower Austria. The final sitting will be held on Saturday.

THE fourth annual series of vacation science courses at Edinburgh was brought to a close last Saturday with an excursion to Melrose and Abbotsford. These courses corresponded to the second part of the Oxford summer gathering, and were remarkably successful. A similar series is being organized for the winter months, and will be specially adapted to "the educational requirements of teachers."

ON August 27 and 28 earthquake shocks were felt along the Danube valley from Amstetten to Grein in Lower Austria. The seismic movement on August 28 lasted ten minutes, and was accompanied by a disturbance of the river, the water rising into long lines of waves similar to those caused by the paddle-wheel of a steamer.

THE Caucasus papers relate an interesting case of globular lightning which was witnessed by a party of geodesists on the summit of the Böhul Mountain, 12,000 feet above the sea. About 3 p.m., dense clouds of a dark violet colour began to rise from the gorges beneath. At 8 p.m., there was rain, which was soon followed by hail and lightning. An extremely bright violet ball, surrounded with rays which were, the party says, about two yards long, struck the top of the peak. A second and a third followed, and the whole summit of the peak was soon covered with an electric light which lasted no less than four hours. The party, with one exception, crawled down the slope of the peak to a better sheltered place, situated a few yards beneath. The one who remained was M. Tatosoff. He was considered dead, but proved to have been only injured by the first stroke of lightning, which had pierced his sheepskin coat and shirt, and burned the skin on his chest, sides, and back. At midnight the second camp was struck by globular lightning of the same character, and two persons slightly felt its effects.

A STUDY of five years' thunderstorms (1882–86) on the Hungarian plain has been recently made by M. Hegyfoky. We note the following points in his paper (communicated to the Hungarian Academy). The days of thunderstorm were those on which thunder was observed, and they formed 16·4 per cent. of all days from April to September. The air-pressure on those days sank about 2 mm. under the normal, morning and evening. The less the pressure, the greater the probability of thunderstorm. The temperature (estimated by the maximum thermometer) was higher than that of all days of the season indicated; and the moisture and cloudiness were similarly in excess. The wind blew about mid-day more softly, and in the evening more strongly than usual. It went round, as a rule, from the south-east by the south to the west and north-west. The clouds came oftener than usual from the south-east and south-west quadrants; so that the centre was generally north of the station. Nearly half of the season's rainfall was on days of thunderstorm. Hail fell on 11 days, on one of which there was no thunderstorm. There were most thunderstorms in June (59 out of 199). The June of 1886 had as many as 26. The commencement of a thunderstorm (first thunder) occurred most often from 2 to 5 p.m. Towards the end of the season the thunderstorms tend to come later in the day. When the pressure falls under the mean of the season (752·4 mm.), the thunderstorms last longer than when it is above the mean. The path was in most cases from south-west or west, and in most cases coincided with that of both lower and upper clouds, but in several cases only with that of the lower or upper. After the first thunder the meteorological elements are usually subject to great changes, most marked as the storm nears the zenith: rain falls, wind rises, and alters quickly in direction, temperature and vapour-pressure fall, relative humidity, cloud, and pressure increase. As the storm withdraws there is a return to the normal. Various other points are considered. The author accepts Sohncke's theory—that the electricity of thunderstorms is due to friction of water-drops on ice.

THE Meteorological Council have just published a series of observations made at Sanchez (Samaná Bay), St. Domingo, in the years 1886–88. They were made chiefly by the late Dr. W. Reid, Medical Officer of the Samaná and Santiago Railway Company. The Council, recognizing the value of the observations, which were taken with much care, and for a locality for which they are very scarce, determined to publish them in detail. The monthly means and summaries have been calculated in the Meteorological Office and added in a convenient form at the end of the volume. From these it is seen that the maximum shade temperature was 96°·5 in September 1887, and the minimum 58°·5 in March 1888. The rainfall varied considerably in the different years—as much as 26 inches. The greatest daily fall was 6 inches in April. The sunshine recorded in 1888 amounted to an average of 6·7 hours daily. Dr. Reid remarks, with regard to the wind, that in about 19 days out of 20 there is a light breeze in the west at 6h. a.m., which continues till about 8h. a.m., then a short calm, then a light breeze from about south, which veers round to east or east-south-east by 10 a.m., and there continues till about 4 p.m., when it remains calm till next morning. Only three gales are recorded during the three years, and these all occurred in 1886.

THE *Pall Mall Gazette* has issued in its "Extra" series a charming story of a dog. It is called "Teufel the Terrier: the Life and Adventures of an Artist's Dog," and is "told by J. Yates Carrington, and edited by Charing Cross." The tale is admirably illustrated, and will give much pleasure to all who study the ways of dogs, and appreciate their intelligence and sense of fun.

PART 23 of Cassell's "New Popular Educator" has been published. Besides the woodcuts in the text, there is a coloured plate illustrating electric discharges in rarefied gases.

MESSRS. GEORGE L. ENGLISH AND CO., of Philadelphia and New York, have published the fifteenth edition of their catalogue of the minerals which they have for sale. There has been in America, they say, a "very great increase in the demand for mineral specimens."

THE proposed creation of Universities in France will soon give rise to much animated discussion in the French Senate. Meanwhile, the Ministry of Public Instruction has prepared a return showing the number of students who at present attend the different French faculties. The total is 16,587, of whom 15,316 are Frenchman and 1271 foreigners, as against only 9863 fifteen years ago. Of this total 5843 students attend the faculty of medicine, 4570 that of law, 1834 that of literature, 1590 that of pharmacy, 1276 that of science, and 101 that of Protestant theology. Rather more than half of these (8653) are students of the different Paris faculties, and of the 1271 foreign students 1078 are in Paris. There are 989 Europeans (313 Russians, 159 Roumanians, and 121 Turks), 201 Americans (of whom 173 come from the United States), 68 Africans (of whom 51 are Egyptians), 12 Asiatics, and 1 Australian. The great majority of these foreigners are studying medicine; 907 belong to that faculty, while 240 are studying law, 58 science, 39 pharmacy, 24 literature, and 3 Protestant theology.

THE *Japan Weekly Mail* in a recent issue notices the publication of a kind of Japanese folk-lore journal, called the *Fuzoku Gwahōo*, the object of which is to collect and record important and curious Japanese national customs. Japanese customs, old and new, are classified by the new journal under seven heads—namely, customs that concern (1) human beings, (2) animals and plants, (3) dress and ornaments, (4) food and beverages, (5) buildings, (6) furniture and coins, (7) miscellaneous. For the illustrations resort is had to old pictures. Every number contains an essay on some interesting custom, with allusions to authorities on the subjects treated.

THE Government of India, it is reported, has decided to discontinue the annual grant hitherto devoted to search for, and purchase of, rare Sanskrit manuscripts, but the decision will not take effect until 1892. A regular staff of native searchers have been employed during the past ten years, and these have visited most of the large temples throughout India, examining and cataloguing the vast collections of works hoarded up there. The private libraries of several native gentlemen have been likewise carefully sifted, and their contents recorded. Of the manuscripts thus examined, no fewer than 2400 have been purchased by the Government, and rendered accessible to the public at Bombay and Calcutta. The most valuable "finds" have included numerous old Jain manuscripts, now being submitted to the scrutiny of competent scholars in Bombay. Although the search and purchase grants are to cease, the Indian Government has agreed to continue the allowance of Rs. 9000 per annum for the publication of texts and translations of the Sanskrit and Persian works discovered.

THE additions to the Zoological Society's Gardens during the past week include a Squirrel Monkey (*Chrysothrix sciurea* ♀) from Guiana, presented by Mrs. Osgood; two Chinese Alligators (*Alligator sinensis*) from China, presented by Mr. D. C. Jansen; a Great-billed Touracou (*Corythaix macrorhyncha*) from West Africa, a Wonga-wonga Pigeon (*Leucosarcia picta*) from Australia, a Madagascar Love Bird (*Agapornis cana*) from Madagascar, purchased.

OUR ASTRONOMICAL COLUMN.

OBJECTS FOR THE SPECTROSCOPE.

Sidereal Time at Greenwich at 10 p.m. on September 4 = 20h. 55m. 52s.

Name.	Mag.	Colour.	R.A. 1890.	Decl. 1890.
			h. m. s.	° ′
(1) G.C. 4627	—	—	20 57 10	+54 7
(2) G.C. 4628	—	Pale blue.	20 58 9	−11 48
(3) 3 Aquarii	5	Reddish-yellow.	20 41 56	− 5 21
(4) β Capricorni	3	Yellowish-white.	20 14 17	−15 10
(5) α Capricorni	4	White.	20 11 0	−12 53
(6) D.M. + 32° 3522 ...	8	Red.	19 36 44	+32 22
(7) V Cygni	Var.	Red.	20 37 46	+47 45

Remarks.

(1) The G.C. description of this nebula is: "Considerably bright; large; elongated in the direction 45° or thereabouts; barely resolvable." The spectrum appears to have been observed only by Dr. Huggins, who recorded:—"One bright line only was distinctly seen, of apparently the same refrangibility as the brightest of the nitrogen lines. This bright line appeared by glimpses to be double. Possibly this appearance was due to the presence near it of a second line. The faintness of the light did not permit the slit to be made sufficiently narrow for the determination of this point." This is an observation well worth repeating, as it may possibly throw some light on the origin of the chief nebula line. The magnesium fluting near λ 500 has been suggested, on various grounds, as the origin of the chief line, and this consists of a rhythmical series of flutings with well-defined edges towards the red end of the spectrum. It may be that the second faint line seen by Dr. Huggins was the second maximum of the compound fluting, but unfortunately he does not state whether it was more or less refrangible than the brighter line.

(2) It appears to be generally agreed that this is one of the finest specimens of planetary nebulæ in the heavens. Lassell saw it as an elliptic ring with a star in the centre. Dr. Huggins and Lieutenant Herschel each recorded three bright, sharp, and distinct lines in its spectrum, and Prof. Winlock suspected a fourth. The spectrum of this nebula might perhaps be advantageously observed in connection with that of the previous nebula. As the temperature of nebulæ indicating hydrogen is probably lower than that of nebulæ in which the hydrogen lines are absent, there is reasonable ground for supposing that the fluted appearance of the chief line (assuming it to be due to